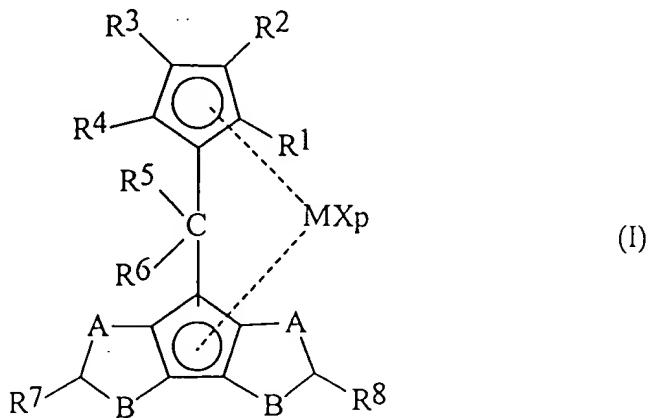


IN THE CLAIMS:

Please rewrite claims 1, 25 and 26 as shown below in the detailed listing of all claims which are, or were, in the application:

1. (Currently amended) A process for the preparation of polymers of ethylene comprising the polymerization reaction of ethylene and optionally one or more olefins in the presence of a catalyst comprising the product obtained by contacting:

(A) a metallocene compound of formula (I):



wherein

the rings containing A and B have a double bond in the allowed position having an aromatic character;

A and B are selected from sulfur (S), oxygen (O) or CR⁹, R⁹ being hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements, with the proviso that if A is S or O, B is CR⁹ or if B is S or O, A is CR⁹, and A and B cannot simultaneously be CR⁹;

R¹, R², R³, R⁴, R⁵, R⁶, R⁷, and R⁸ which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements, and at least two adjacent substituents R¹ and R², R³ and R⁴, or R⁵ and R⁶ can form a ring comprising 4 to 8 atoms, and where ~~at least one of R¹, R², R³, R⁴, R⁵ and R⁶ is not hydrogen;~~

M is an atom of a transition metal selected from group 3, 4, 5, 6 or the lanthanide or actinide groups in the Periodic Table of the Elements,

X, which may be the same as or different from each other, is hydrogen, halogen atom, a R¹⁰, OR¹⁰, OSO₂CF₃, OCOR¹⁰, SR¹⁰, NR¹⁰₂ or PR¹⁰₂ group, wherein the substituents R¹⁰ are hydrogen, a

U.S. Patent Appln. S.N. 09/914,305
AMENDMENT AFTER FINAL REJECTION

PATENT

C_1-C_{20} -alkyl, C_3-C_{20} -cycloalkyl, C_2-C_{20} -alkenyl, C_6-C_{20} -aryl,
 C_7-C_{20} -alkylaryl, or C_7-C_{20} -arylalkyl radical, optionally containing
heteroatoms belonging to groups 13 or 15-17 of the Periodic Table
of the Elements;

p is an integer of from 1 to 3, being equal to the oxidation
state of the metal M minus 2;

with the proviso that at least one of R⁷ and R⁸ is not
hydrogen;

and

(B) at least one member selected from the group consisting of an
alumoxane and a compound of formula D⁺E⁻, wherein D⁺ is a Brønsted
acid, which gives a proton and reacts irreversibly with a
substituent X of the metallocene of formula (I) and E⁻ is a
compatible anion, which stabilizes the active catalytic species
originating from the reaction of the two compounds, and which is
removed by an olefinic monomer.

2. (Previously amended) The process according to claim 1,
wherein in the metallocene compound of formula (I) the transition
metal M is selected from the group consisting of titanium,
zirconium and hafnium.

3. (Previously amended) The process according to claim 1, wherein in the metallocene compound of formula (I) the X substituents are chlorine atoms or methyl groups.

4. (Previously amended) The process according to claim 1, wherein in the metallocene compound of formula (I) A and B are sulfur or a CH group, and if A is a CH group, B is sulfur, or if B is a CH group, A is sulfur, R⁵ and R⁶ are C₁-C₂₀-alkyl groups, and R⁷ is equal to R⁸.

5. (Previously amended) The process according to claim 4, where R¹, R³ and R⁴ are hydrogen, R⁵ and R⁶ are methyl, R² is C₁-C₂₀-alkyl groups and R⁷ and R⁸ are methyl groups.

6. (Previously amended) The process according to claim 1, wherein said alumoxane is obtained by contacting water with an organo-aluminium compound of formula H_jAlR¹²_{3-j} or H_jAl₂R¹²_{6-j}, where R¹² substituents, same or different, are hydrogen atoms, C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl, optionally containing silicon or germanium atoms, and j ranges from 0 to 1, being also a non-integer number.

7. (Previously amended) The process according to claim 6, wherein said alumoxane is methylalumoxane (MAO), tetra-(isobutyl)alumoxane (TIBAO), tetra-(2,4,4-trimethyl-pentyl)alumoxane (TIOAO), tetra-(2,3-dimethylbutyl)alumoxane (TDMBAO) or tetra-(2,3,3-trimethylbutyl)alumoxane (TTMBAO).

Claim 8 (Canceled)

9. (Previously amended) The process according to claim 1, wherein the anion E⁻ comprises one or more boron atoms.

10. (Previously amended) The process according to claim 1, wherein the process is carried out in the presence of an alpha-olefin selected from the group consisting of propylene, 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, 1-octene, 1-decene and 1-dodecene.

11. (Original) The process according to claim 10, wherein said alpha-olefin is 1-hexene or propylene.

12. (Original) The process according to claim 10, wherein the molar content of alpha-olefin derived units is between 0% and 60%.

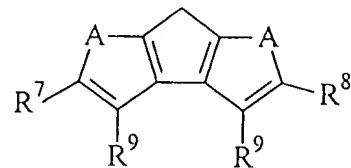
13. (Previously amended) The process according to claim 1, wherein the process is carried out in the presence of a cyclic monomer.

14. (Original) The process according to claim 13, wherein the cyclic comonomer is 5-ethyliden-2-norbornene.

15. (Previously amended) The process according to claim 13, wherein the molar content of the cyclic monomer is between 0 mol% and 30 mol%.

Claims 16-19 (Canceled)

20. (Previously amended) A process for preparing the compound of formula (VII)



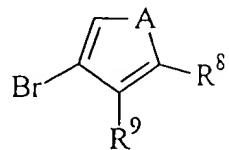
(VII)

wherein A is sulfur (S) or oxygen (O), R⁹ is hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements;

R⁷ and R⁸ which may be the same as or different from each other, are a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements;

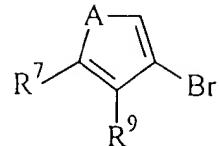
comprising the following steps:

- i) contacting an equimolar mixture of compounds of formulae (XI) and (XII):



and

(XI)



(XII)

wherein A is sulfur or oxygen,

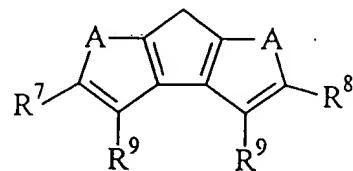
with a Lewis acid or a mixture of a Lewis acid and a protonic acid;

- ii) treating the thus obtained product from step i) with CH₂O in a molar ratio between said mixture and CH₂O of a range between 10:1 and 1:10;
- iii) contacting the thus obtained product from step ii) with a compound selected from an organolithium compound, sodium or potassium; and
- iv) contacting the thus obtained product from step iii) with an agent selected from the group consisting of copper (II) chloride, iodine and Mg/Pd, in order to obtain a compound of general formula (VII).

21. (Previously amended) The process according to claim 20, wherein the Lewis acid is selected from the group consisting of zinc dichloride, cadmium dichloride, mercury dichloride, tin tetrachloride, trifluoroborane, zirconium tetrachloride, and titanium tetrachloride.

Claim 22 (Canceled)

23. (Previously amended) A process for preparing the compound of formula (VII)



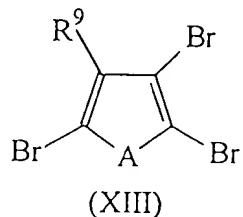
(VII)

wherein A is sulfur (S) or oxygen (O), R⁹ is hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements;

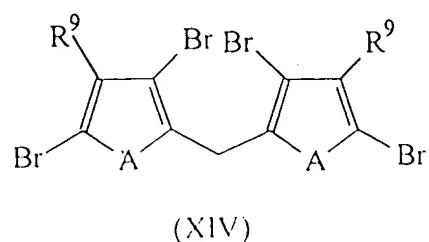
R and R' which may be the same as or different from each other, are a C₁-C₂₀-alkyl, C₁-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements;

comprising the following steps:

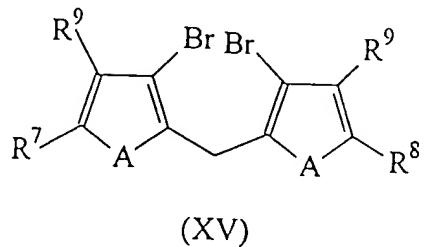
- i) contacting a compound of formula (XIII):



with a base selected from an organolithium compound, sodium or potassium; treating with a formic ester, wherein the molar ratio between said ester and the compound of formula (XIII) is at least 1:2, and subsequently treating the obtained product with a reducing agent in order to obtain a compound of formula (XIV):



ii) contacting the compound of formula (XIV) with a base selected from an organolithium compound, sodium or potassium and subsequently treating the dimetallated compound with an alkylating agent to obtain the compound of formula (XV);

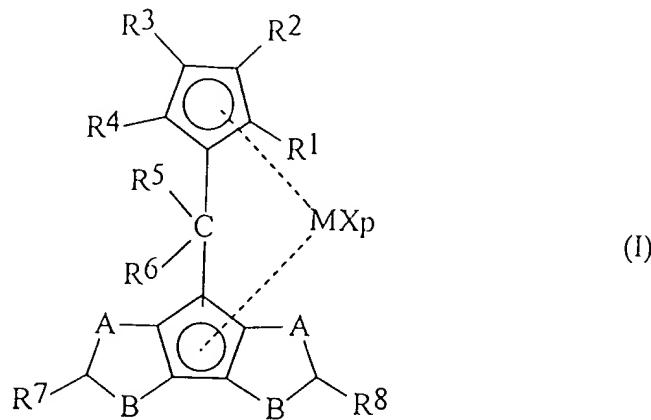


and

iii) contacting the alkylated compound obtained by step ii) with a coupling agent selected from the group consisting of copper (II) chloride, iodine and Mg/Pd in order to obtain the compound of formula (VII).

Claim 24 (Canceled)

25. (Currently amended) A metallocene compound of formula (I):



wherein

A and B are selected from sulfur (S), oxygen (O) or CR⁹, R⁹ being hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements, with the proviso that if A is S or O, B is CR⁹ or if B is S or O, A is CR⁹, and A and B cannot simultaneously be CR⁹;

R¹, R², R³, R⁴, R⁵, R⁶, R⁷, and R⁸ which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or

C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements, and at least two adjacent substituents R¹ and R², R³ and R⁴, or R⁵ and R⁶ can form a ring comprising 4 to 8 atoms; and where ~~at least one of R¹, R², R³, R⁴, R⁷ and R⁸ is not hydrogen;~~

M is an atom of a transition metal from group 3, 4, 5, 6 or the lanthanide or actinide groups in the Periodic Table of the Elements,

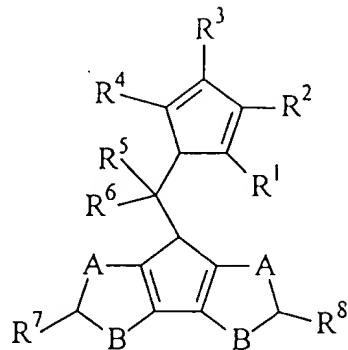
X, which may be the same as or different from each other, is hydrogen, halogen atom, a R¹⁰, OR¹⁰, OSO₂CF₃, OCOR¹⁰, SR¹⁰, NR¹⁰₂ or PR¹⁰₂ group, wherein the substituents R¹⁰ are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements;

p is an integer of from 1 to 3, being equal to the oxidation state of the metal M minus 2;

and wherein the rings containing A and B have a double bond in the allowed position having an aromatic character; and

with the proviso that at least one of R⁷ and R⁸ is not hydrogen.

26. (Currently amended) A ligand of formula (II):



(II)

or its double bond isomers,

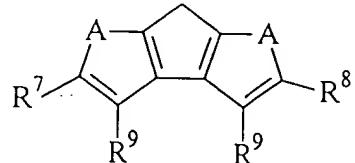
wherein the rings containing A and B have double bonds in any of the allowed positions, having an aromatic character and

A and B are selected from sulfur (S), oxygen (O) or CR⁹, R⁹ being hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements, with the proviso that if A is S or O, B is CR⁹ or if B is S or O, A is CR⁹, and A and B cannot simultaneously be CR⁹;

R¹, R², R³, R⁴, R⁵, R⁶, R⁷, and R⁸ which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or

C₁-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements, and at least two adjacent substituents R¹ and R², R³ and R⁴, or R⁵ and R⁶ can form a ring comprising 4 to 8 atoms and wherein at least one of the substituents R¹, R², R³, R⁴, R⁵, and R⁶ is not hydrogen;
with the proviso that at least one of R⁷ and R⁸ is not hydrogen.

27. (Previously amended) A process for preparing the compound of formula (VII)

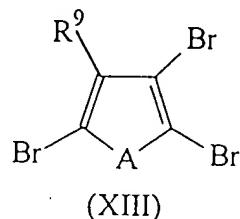


(VII)

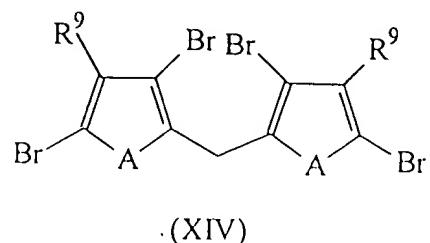
wherein A is sulfur (S) or oxygen (O), R⁹ is hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₁-C₂₀-alkylaryl, or C₁-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements;

R^7 and R^8 which may be the same as or different from each other, are a C_1 - C_{20} -alkyl, C_1 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13 or 15-17 of the Periodic Table of the Elements;
comprising the following steps:

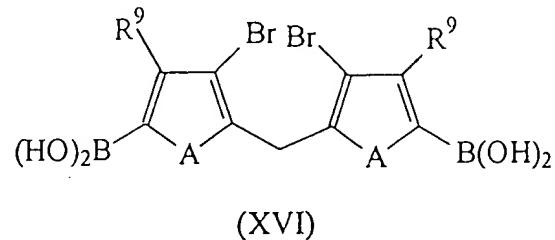
- i) contacting a compound of formula (XIII):



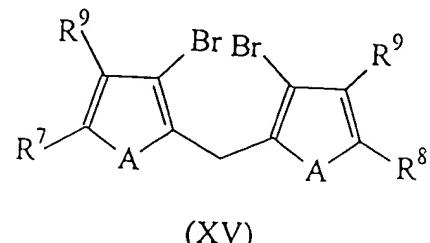
with a base selected from an organolithium compound, sodium or potassium; treating with a formic ester, wherein the molar ratio between said ester and the compound of formula (XIII) is at least 1:2, and subsequently treating the obtained product with a reducing agent in order to obtain a compound of formula (XIV):



ii) contacting the compound of formula (XIV) with a base selected from an organolithium compound, sodium or potassium and subsequently treating the dimetallated compound with an ester of boric acid and a protonating agent in order to obtain the compound of formula (XVI):



and subsequently contacting with a mixture of an alkylating agent in the presence of an transition metal complex compound for obtaining the compound of formula (XV);



and

iii) contacting the alkylated compound obtained by step ii) with a coupling agent selected from the group consisting of copper (II) chloride, iodine and Mg/Pd in order to obtain the compound of formula (VII).